What is claimed is:

1. A combined battery and device apparatus comprising:

a first structure including:

a first conductive layer;

a battery including a cathode layer; an anode layer, and an electrolyte layer located between and electrically isolating the anode layer from the cathode layer, wherein the anode or the cathode or both include an intercalation material, the battery disposed such that either the cathode layer or the anode layer is in electrical contact with the first conductive layer, and

an electrical circuit having a major surface adjacent face-to-face to and electrically connected to the battery.

2. The apparatus according to claim 1, further comprising:

a photovoltaic cell having a major surface adjacent face-to-face to the first structure; and

an integrated circuit operatively coupled to charge the battery using current from the photovoltaic cell.

3. The apparatus according to claim 1, further comprising a photovoltaic cell having a major surface adjacent face-to-face to a surface of the battery.

4. The apparatus according to claim 1, further comprising:

a substrate, the battery having a major surface adjacent face-to-face to the substrate; and

a photovoltaic cell having a major surface adjacent face-to-face to a surface of the substrate beside the battery.

5. The apparatus according to claim 1, further comprising:

a substrate, the battery having a major surface adjacent face-to-face to the substrate; and

a photovoltaic cell having a major surface adjacent face-to-face to an opposite face surface of the substrate from the battery.

6. The apparatus according to claim 1, wherein the electrical circuit comprises:

a photovoltaic cell having a major surface adjacent face-to-face to the battery; and

a charging circuit supported on the photovoltaic cell and electrically coupled to charge the battery using current from the photovoltaic cell.

7. The apparatus according to claim 1, wherein the electrical circuit includes a thin-film capacitor adjacent to the battery.

8. The apparatus according to claim 1, wherein the electrical circuit includes:

a thin-film capacitor adjacent to the battery; and

an integrated circuit mounted on the capacitor and electrically connected to the battery and the capacitor.

9. The apparatus according to claim 1, wherein the electrical circuit includes:

an insulating layer adjacent to the battery; and

a plurality of electrical traces adjacent to the insulating layer, wherein at least one of the plurality of electrical traces contacts an electrode of the battery through the insulating layer.

10. The apparatus according to claim 1, the electrical circuit further comprising:

an insulating layer adjacent to the battery;

a plurality of electrical traces adjacent to the insulating layer; and

an integrated circuit supported on the battery, wherein a first one of the plurality of electrical traces electrically connects the cathode of the battery and the integrated circuit, a second one of the plurality of electrical traces electrically connects the anode of the battery and the integrated circuit.

11. The apparatus according to claim 1, the substrate further comprising:

an integrated circuit; and

an insulating layer adjacent to the integrated circuit, the insulating layer including a plurality of through vias, wherein the battery is adjacent to the insulating layer, wherein the

cathode of the battery electrically connects to the integrated circuit though a first one of plurality of through vias, and the anode of the battery electrically connects to the integrated circuit though a second one of plurality of through vias.

12. The apparatus according to claim 1, the substrate further comprising:

an integrated circuit; and

an insulating layer adjacent to the integrated circuit, the insulating layer including a plurality of through vias, wherein a cathode-conductor of the battery is adjacent to the insulating layer and electrically connects to the integrated circuit though a first one of plurality of through vias, the cathode layer of the battery is adjacent to the cathode conductor, the electrolyte layer is adjacent to the cathode layer, and the anode is adjacent to the electrolyte layer and electrically connects to the integrated circuit though a second one of plurality of through vias.

13. The apparatus according to claim 1, the substrate further comprising:

an integrated circuit; and

an insulating layer adjacent to the integrated circuit, the insulating layer including a plurality of through vias, wherein a cathode-conductor of the battery is adjacent to a face of the integrated circuit opposite the insulating layer and electrically connects to the integrated circuit though a first one of plurality of through vias, the cathode layer of the battery is adjacent to the cathode conductor, the electrolyte layer is adjacent to the cathode layer, and the anode is adjacent to the electrolyte layer and electrically connects to the integrated circuit though a second one of plurality of through vias.

14. The apparatus according to claim 1, the electrical circuit further comprising:

an insulating layer adjacent to the battery that acts as a passivation layer that protects the anode from environmental corrosion; and

a plurality of electrical traces adjacent to the insulating layer, wherein at least one of the plurality of electrical traces contacts an electrode of the battery through the insulating layer.

15. The apparatus according to claim 1, wherein the substrate has a curved shape having a

convex face and a concave face, and the battery is located on the concave face.

16. The apparatus according to claim 1, wherein the substrate comprises a polymer having a melting point substantially below 700 degrees centigrade.

17. The apparatus according to claim 1, wherein the substrate comprises a metal foil.

18. The apparatus according to claim 1, wherein the substrate comprises a metal foil having an insulative layer between the metal foil and the first conductive layer adjacent to a first surface area of the substrate's major surface area.

19. The apparatus according to claim 1, wherein the substrate comprises a ceramic.

20. The apparatus according to claim 1, wherein the substrate comprises a glass.

21. A method for making a combined battery and device apparatus, the method comprising:

providing a substrate having a major surface area;

depositing a first conductive layer on a first surface area of the substrate's major surface area;

depositing onto the first conductive layer a battery including a cathode layer; an anode layer, and a electrolyte layer located between and electrically isolating the anode layer from the cathode layer, wherein the anode or the cathode or both include an intercalation material, the battery disposed such that either the cathode layer or the anode layer is in electrical contact with the first conductive layer; and

depositing an electrical circuit on the battery.

22. The method according to claim 21, further comprising:

depositing a photovoltaic cell on the first structure;

attaching an integrated circuit to the first structure; and

operatively coupling the integrated circuit to charge the battery using current from the

photovoltaic cell.

23. The method according to claim 21, further comprising depositing a photovoltaic cell on a surface of the battery.

24. The method according to claim 21, further comprising depositing a photovoltaic cell on a surface of the substrate beside the battery.

25. The method according to claim 21, further comprising depositing a photovoltaic cell on an opposite face surface of the substrate from the battery.

26. The method according to claim 21, wherein depositing the electrical circuit comprises:

depositing a photovoltaic cell on the battery;

supporting a charging circuit on the photovoltaic cell; and

electrically coupling the charging circuit to charge the battery using current from the photovoltaic cell.

27. The method according to claim 21, further comprising depositing a thin-film capacitor on the battery.

28. The method according to claim 21, wherein depositing the electrical circuit comprises:

depositing a thin-film capacitor on the battery;

mounting an integrated circuit on the capacitor; and

electrically connecting the integrated circuit to the battery and the capacitor.

29. The method according to claim 21, further comprising:

depositing an insulating layer on the battery; and

depositing a plurality of electrical traces on the insulating layer, wherein at least one of the plurality of electrical traces contacts an electrode of the battery through the insulating layer.

30. The method according to claim 21, further comprising:

depositing an insulating layer on the battery;

depositing a plurality of electrical traces on the insulating layer;

supporting an integrated circuit on the battery;

electrically connecting a first one of the plurality of electrical traces to the cathode of the battery and the integrated circuit; and

electrically connecting a second one of the plurality of electrical traces to the anode of the battery and the integrated circuit.

31. The method according to claim 21, wherein the substrate includes an integrated circuit, the method further comprising:

depositing an insulating layer on the integrated circuit, the insulating layer including a plurality of through vias, wherein the battery is adjacent to the insulating layer;

electrically connecting the cathode of the battery to the integrated circuit though a first one of plurality of through vias; and

electrically connecting the anode of the battery to the integrated circuit though a second one of plurality of through vias.

32. The method according to claim 21, wherein the substrate includes an integrated circuit, the method further comprising:

depositing an insulating layer adjacent to the integrated circuit, the insulating layer including a plurality of through vias;

depositing a cathode-conductor of the battery on the insulating layer;

electrically connecting the cathode-conductor of the battery to the integrated circuit though a first one of plurality of through vias;

depositing the cathode layer of the battery on the cathode conductor;

depositing the electrolyte layer on the cathode layer;

depositing the anode on the electrolyte layer; and

electrically connecting the anode to the integrated circuit though a second one of plurality of through vias.

33. The method according to claim 21, wherein the substrate includes an integrated circuit, the method further comprising:

depositing an insulating layer on the integrated circuit, the insulating layer including a plurality of through vias;

depositing a cathode-conductor of the battery on a face of the integrated circuit opposite the insulating layer;

electrically connecting the cathode-conductor of the battery to the integrated circuit though a first one of plurality of through vias;

depositing the cathode layer of the battery on the cathode conductor;

depositing the electrolyte layer on the cathode layer;

depositing the anode on the electrolyte layer; and

electrically connecting the anode to the integrated circuit though a second one of plurality of through vias.

34. The method according to claim 21, further comprising:

depositing an insulating layer on the battery that acts as a passivation layer that protects the anode from environmental corrosion;

depositing a plurality of electrical traces on the insulating layer, wherein at least one of the plurality of electrical traces contacts an electrode of the battery through the insulating layer.

35. The method according to claim 21, further comprising:

forming the substrate into a curved shape having a convex face and a concave face; and

locating the battery on the concave face.

36. The method according to claim 21, wherein the substrate comprises a polymer having a melting point substantially below 700 degrees centigrade.

37. The method according to claim 21, wherein the substrate comprises a metal foil.

38. The method according to claim 21, wherein the substrate comprises a metal foil having an

insulative layer between the metal foil and the first conductive layer is deposited on a first surface area of the substrate's major surface area.

39. The method according to claim 21, wherein the substrate comprises a ceramic material.

40. The method according to claim 21, wherein the substrate comprises a glass material.

41. The method according to claim 21, wherein the depositing of the battery comprises:
depositing the cathode layer onto the first conductive layer;
depositing the electrolyte layer onto the cathode layer; and
depositing the anode material onto the electrolyte layer.

42. The method according to claim 41, wherein the depositing of the battery comprises depositing the cathode layer onto the first conductive layer and annealing a surface of the cathode material to a temperature higher than that of the electrical circuit underlying the cathode layer.

43. The method according to claim 41, wherein the depositing of the battery comprises depositing the electrolyte layer onto the first conductive layer and annealing a surface of the electrolyte layer material to a temperature higher than that of the electrical circuit underlying the electrolyte layer.

44. A method for making a combined battery and device apparatus, the method comprising:
providing an electrical circuit having a major surface area and having a first conductive layer on a first surface area of the electrical circuit's major surface area; and
depositing onto the first conductive layer a battery comprising a cathode layer; an anode layer, and a electrolyte layer located between and electrically isolating the anode layer from the cathode layer, the battery disposed such that either the cathode layer or the anode layer is in electrical contact with the first conductive layer, wherein the anode or the cathode or both include an intercalation material.

45. The method according to claim 44, wherein the depositing of the battery comprises:

depositing the cathode layer onto the first conductive layer;

depositing the electrolyte layer onto the cathode layer; and

depositing the anode material onto the electrolyte layer.

46. The method according to claim 45, wherein the depositing of the battery comprises:

depositing the cathode layer onto the first conductive layer and annealing a surface of the cathode material to a temperature higher than that of the electrical circuit underlying the cathode layer.

47. The method according to claim 45, wherein the depositing of the battery comprises:

depositing the electrolyte layer onto the first conductive layer and annealing a surface of the electrolyte layer material to a temperature higher than that of the electrical circuit underlying the electrolyte layer.

48. A combined battery and device apparatus comprising:

a first structure including:

a substrate having a major surface area;

a first conductive layer adjacent to a first surface area of the substrate's major surface area;

a battery comprising a cathode layer; an anode layer, and a electrolyte layer located between and electrically isolating the anode layer from the cathode layer, the battery disposed such that either the cathode layer or the anode layer is in electrical contact with the first conductive layer, wherein the anode or the cathode or both include an intercalation material; and

an electrical circuit adjacent to and electrically connected to the battery.

49 The apparatus according to claim 48, further comprising:

a photovoltaic cell adjacent to the first structure; and

an integrated circuit operatively coupled to charge the battery using current from the photovoltaic cell.

50. The apparatus according to claim 48, further comprising a photovoltaic cell adjacent to a surface of the battery.

51. The apparatus according to claim 48, further comprising a photovoltaic cell adjacent to a surface of the substrate beside the battery.

52. The apparatus according to claim 48, further comprising a photovoltaic cell adjacent to an opposite face surface of the substrate from the battery.

53. The apparatus according to claim 48, wherein the electrical circuit comprises:

a photovoltaic cell adjacent to the battery; and

a charging circuit supported on the photovoltaic cell and electrically coupled to charge the battery using current from the photovoltaic cell.

54. The apparatus according to claim 48, wherein the electrical circuit includes a thin-film capacitor adjacent to the battery.

55. The apparatus according to claim 48, wherein the electrical circuit includes:

a thin-film capacitor adjacent to the battery; and

an integrated circuit mounted on the capacitor and electrically connected to the battery and the capacitor.

56. A combined battery and device apparatus comprising:

a substrate;

first conductive layer adjacent face-to-face to the substrate;

a battery having a plurality of layers including:

a cathode layer;

an anode layer; and

an electrolyte layer located between and electrically isolating the anode layer from the cathode layer, wherein the anode or the cathode or both include an intercalation material, the

battery disposed such that either the cathode layer or the anode layer is in electrical contact with the first conductive layer; and

an electrical circuit adjacent face-to-face to the substrate; wherein the electrical circuit has a plurality of layers, and one of the plurality of layers of the electrical circuit and one of the plurality of layers of the battery have substantially identical thicknesses, chemical composition and material characteristics.

57. The apparatus according to claim 56, wherein two or more of the plurality of layers of the electrically powered device have a composition substantially identical to and a thickness substantially identical to two or more respective layers of the plurality of layers of the battery.

58. The apparatus according to claim 56, wherein the anode includes a lithium-intercalation material.

59. The apparatus according to claim 56, wherein the cathode includes a lithium-intercalation material.

60. The apparatus according to claim 56, wherein the solid-state electrolyte layer includes a LiPON material.

61. The apparatus according to claim 56, wherein the anode includes a lithium-intercalation material, the cathode includes a lithium-intercalation material, and the solid-state electrolyte layer includes a LiPON material.

62. A method for making a combined battery and electrically powered device, the method comprising:

providing a substrate having a major surface area;

depositing a plurality of layers of the battery on a first surface area of the substrate's major surface area, wherein the plurality of layers of the battery include a cathode layer; an anode layer, and a solid-state electrolyte layer located between and electrically isolating the

anode layer from the cathode layer, wherein the anode or the cathode or both include an intercalation material or a metal or both; and

depositing a plurality of layers of the electrically powered device on a first surface area of the substrate's major surface area, wherein one of the plurality of layers of the electrically powered device has a composition substantially identical to and is deposited substantially simultaneously with one of the plurality of layers of the battery.

63. The method according to claim 62, wherein two or more of the plurality of layers of the electrically powered device have a composition substantially identical to and are deposited substantially simultaneously with two or more respective layers of the plurality of layers of the battery.

64. The method according to claim 62, wherein the anode includes a lithium-intercalation material.

65. The method according to claim 62, wherein the cathode includes a lithium-intercalation material.

66. The method according to claim 62, wherein the solid-state electrolyte layer includes a LiPON material.

67. The method according to claim 62, wherein the anode includes a lithium-intercalation material, the cathode includes a lithium-intercalation material, and the solid-state electrolyte layer includes a LiPON material.